

Skybridge Spectrum Foundation
Telesaurus Holdings GB LLC
Environmental LLC
Verde Systems LLC
V2G LLC
Intelligent Transportation & Monitoring Wireless LLC

2649 Benvenue Ave, Berkeley CA 94704
2509 Stuart St, Berkeley CA 94705

510.841.2220 - phone
510.740.3412 - fax

Warren C. Havens
President

Ex parte presentation

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Marlene H. Dortch
FCC Office of the Secretary
445 12th Street, SW
Washington, DC 20054

Wireless Telecommunications Bureau:

Paul D'Ari: paul.dari@fcc.gov
Jim Schlichting: jim.schlichting@fcc.gov
Paul Murray: paul.murray@fcc.gov
Nese Guendelsberger: nese.guendelsberger@fcc.gov

Office of Engineering and Technology:

Julius Knapp: julius.knapp@fcc.gov
Ira Keltz: ira.keltz@fcc.gov
Alan Stillwell: alan.stillwell@fcc.gov
Ronald Repasi: ronald.repasi@fcc.gov
Bruce Romano: bruce.romano@fcc.gov

Re: WT 06-49: the *LMS-M ITS Radio Service* NPRM.

The following supplements the preceding 2010 filings in this docket by the entities listed above (here, "SkyTel"). In this filing, SkyTel presents two matters:

- (1) The interim report of the Institute of Transportation Studies at the University of California, Berkeley¹ of its ongoing study previously summarized by Sky-Tel in this docket.²
- (2) SkyTel's augmented plans for its M-LMS (and other) spectrum as a result of FCC Auction 87.

¹ See <http://its.berkeley.edu/>.

² Christian Manasseh, Raja Sengupta, Adib Kanafani, Kannan Ramachandran, "High-Accuracy-Location Based Services Infrastructure (Next-Generation US Positioning Infrastructure)" commenced in 1Q 2010 by a charitable donation from SkyTel's joint-operations company, ATLIS Wireless. See "Acknowledgment" in the interim report.

Item 1, the UC Berkeley Institute of Transportation Studies' interim report, shows the great value to the nation that will be achieved by nationwide high accuracy location infrastructure and services: *these require M-LMS under current rules.*

Item 2, the nationwide implementation plan, summarizes a cost effective means by which SkyTel plans to achieve nationwide high accuracy location infrastructure and services (and complementary services) at no cost to governmental and any end users for the core service: *M-LMS will play an essential role in this— if the current rules are not changed.*

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The UC Berkeley report is provided as Attachment 1 hereto.^{3 4}

While it is well summarized and easy to review, below are its essential conclusions and relevant notes for purposes of this ex parte presentation.

This interim report focuses on estimated annual economic benefits of a nationwide infrastructure to provide nearly-ubiquitous sub-meter accuracy location (C-HALO) that will enable a host of critical "Intelligent Transportation System" roadway applications, and other services.

It concludes (emphasis and item in brackets added):

...[T]he sum of these [annualized] benefits ranges from \$40 billion to \$70 billion.⁵ This range depends on whether one uses the mid-level safety application efficacy rates or the low-level efficacy rates. This translates into 0.3 to 0.5 percent of GDP. The safety benefits in the analysis dominate, making up almost 70 percent of the total benefits calculated. Another thing to understand going forward is that sustainability benefits still need to be calculated and addressed. These are believed to be significant and should increase this total figure further. In addition, the safety figures will also increase due to the fact that in this analysis the database was limited to fatal accidents whereas our ultimate analysis will be more exhaustive.

The above quote, along with other materials Sky-Tel provide in its Scribd C-HALO folder (including the Australian study on the benefits of nationwide C-HALO, presented by Sky-Tel

³ A copy is also available within the Sky-Tel Scribd collections: (i) in the collection on Cooperative High Accuracy Location ("C-HALO") and Smart Transport, Energy and Environment Radio ("STEER") at: http://www.scribd.com/document_collections/2340784, and (ii) this particular interim report in that collection is at: <http://www.scribd.com/doc/37796067/Nationwide-Cooperative-High-Accuracy-Location-C-HALO-Infrastructure-Cost-Benefit-Study-Aug-2010-Interim-Report-UC-Berkeley-Institute-of-Transport>.

⁴ Sky-Tel provided the principal funding, by a charitable grant, for this study, as well as the formative ideas for the study over the course of preceding-years studies they funded at UB Berkeley on C-HALO and STEER.

⁵ For a perspective, CITA reported \$153 billion total in year 2009 total revenues for commercial wireless. See http://files.ctia.org/pdf/CTIA_Survey_Year_End_2009_Graphics.pdf. The revenue figure vs. the C-HALO (partial) estimated benefits figure is not a direct comparison of course, (i) the partial C-HALO savings benefits do not include other forms of benefits, and do not include any revenues generated by C-HALO commercial services (some will be nonprofit at no cost to end users, as the undersigned entities plan, and some will be for-profit: others may pursue C-HALO as well, of course), and (ii) the CITA revenue report does not include benefits provided by the service, if they were assessed. However, this comparison indicates the great potential benefits of C-HALO to the nation.

earlier this year in this docket) indicate that the total annual benefits of nationwide C-HALO in the US *will be a substantial multiple* of those projected above, *which could exceed US commercial wireless revenues, as a rough comparison* (see preceding footnote as to such comparison).⁶

As other papers in Sky-Tel's Scribd C-HALO collection suggest (also presented earlier in this docket), nationwide *C-HALO may become one of the fundamental nationwide infrastructures in safety, financial and quality-of-life benefits*, after transportation, energy, telecommunications and one or two others.

Further, thus far, C-HALO also projects to be highly justified in terms of benefits to costs, even if used only for the land ITS services involved in this UC Berkeley study to date, especially implemented using a foundation of the widest-area, lowest-cost and most secure means available: Meteor Burst Communications: see Section II below.

As the report explains, this study and the interim conclusions above involve many important land Intelligent Transportation Systems ("ITS") uses of C-HALO. *M-LMS* can provide much of the wireless required for said C-HALO ITS, as the undersigned have advocated in this proceeding for years, and as the Commission correctly determined in allocating the *M-LMS* spectrum for ITS location and monitoring and promulgating the LMS rules.

Changing the rules as the NPRM suggests, and other M-LMS licenses espouse—none with credible technical or public-interest demonstrations—will destroy M-LMS for these critical C-HALO ITS purposes in the nation.

This appears to be the first study of its kind regarding C-HALO (and similar concepts) for the US. Other nations have or are in the process of similar studies for their nations: e.g., Sky-Tel includes the Australian study in its C-HALO & STEER Scribd collection. The US has been the world leader in location technology and systems (and more broadly, PNT) and should remain so.

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The SkyTel recently augmented network plan is summarized below.

We have previously summarized in this docket N-RTK, including by a copy of a report by Professor Chris Rizos Sky-Tel commissioned for its purposes, including presenting in this docket. A first issue to solve in nationwide N-RTK is constant and affordable delivery of the N-RTK corrected GPS-GNSS data over very wide areas, ideally, wider than commercial wireless.

To this end, with experts Sky-Tel researched Meteor Burst Communications ("MBC"), found it especially suitable for the widest-area (truly nationwide with virtually no gaps) and most cost-effective delivery nationwide of N-RTK and associated core ITS data. To implement MBC, Sky-Tel members Skybridge, V2G, and Intelligent Transport (using their short names) participated in the FCC recent Auction 87 acquiring approximately 1,000 Part 22 geographic licenses in the

⁶ This interim report does not attempt to assess all ITS applications, or applications in other sectors such as agriculture, mining, civil engineering and construction; maritime, rail and aircraft ITS; digital map creation and maintenance, and other sectors. Also, in large part, the same C-HALO wireless-systems infrastructure that can provide C-HALO for land ITS can also provide it to these other sectors.

range required for MBC.⁷ These are licenses in the 43 and 35 MHz range. These and the other Sky-Tel entities' licenses are listed here: <http://www.scribd.com/doc/36614169/Sky-Tel-Atlas-900-200-40-MHz-for-Smart-Transport-Energy-Environment-V3-9-10-Public>.

While not currently well known, and on first impression apparently not suitable for highly secure, reliable, and robust communications—(bouncing signals off of the billions of daily ionized meteor trails sounds like science fiction, or hobby radio)—MBC is just that. The literature on MBC is clear on these and other fundamentals, summarized in part (regarding 2G MBC, which is the limit of MBC to date) at: <http://www.scribd.com/doc/37850746/UN-ITU-2G-Meteor-Burst-Communications-Illustrated-Description-Wiith-Sky-Tel-Notes>.

As indicated therein, each MBC link is up to about 1200 miles long. While the data rate and time gaps between usable MBC reflections noted therein are substantial limitations, those can be improved by many factors, and we think some order of magnitude based on research to date. The fundamental reasons are simple: by using far more spectrum at far more base stations,⁸ and more spectrum-efficient modern protocols, wider channels, noise mitigation, smart (but affordable) antennas, etc.—the very limited 2G results can be dramatically improved (as they have in 2G vs 4G commercial wireless: MBC skipped 3G for historic reasons, and what we call 3G MBC is equivalent in technology level to 4G commercial wireless).

Sky-Tel is engaged with a number of MBC and other wireless engineer experts in developing 3G MBC as noted in the head notes on the above document, and the cover notes to its MBC collection on Scribd here: http://www.scribd.com/my_document_collections. The Sky-Tel plan for nationwide 3G MBC and integrated regional mesh and fixed wireless nets, in large part based on M-LMS, is further summarized as follows:

Use of the Sky-Tel entities' 43 MHz and 35 MHz for MBC, and integrated fixed and mobile mesh nets (and some traditional terrestrial wide-area trunked systems with fixed base stations) using Sky-Tel's 200 and 900 MHz, including M-LMS, to provide nationwide wireless for:

1. Environment. US environmental monitoring and protection, with no substantial gaps even in most remote area.
2. Transport & Energy. Fixed and mobile wireless for smart transport and energy systems and other critical infrastructure. Mostly non-realtime (close to real-time) telemetry.

⁷ As of the date of this ex parte presentation, the FCC has accepted for filing and placed on Public Notice the long forms Sky-Tel entities submitted to be awarded these licenses. They are fully paid for. MBC effectively operates only from about 30 to 50 MHz.

⁸ The US Department of Agriculture operates "SNOTEL" MBC systems. See <http://www.wcc.nrcs.usda.gov/factpub/sntlfct1.html>, <http://www.wcc.nrcs.usda.gov/snow/>, and https://www.fbo.gov/index?s=opportunity&mode=form&id=c49a922f181c2478286943ae0cfeeca6&tab=core&_cview=0, and it also operates "SCAN" MBC systems: see preceding link and <http://www.wamis.org/agm/meetings/etmner06/S2-Schaefer.pdf>. DOA used five master stations (see links above) to cover close to the entire US for its fixed-remote station networks. Sky-Tel plans to use, and has acquired the FCC licenses to provide, approximately 30 master base stations (and holds the same and additional channels in all adjacent areas for reverse links). This will accommodate mobile and fixed remote stations and provide far more capacity. Sky-Tel also has wider channels, from 40 to 100 kHz wide (consolidation of adjacent 20 kHz wide channels).

3. Sub-Nano-Second Timing. Sub-nanosecond highly secure time synchronization over very long distances (adds security, along with Position, Navigation, and Timing applications). Includes nationwide back up of GPS high-accuracy timing. This is possible based on research and tests. This development is proprietary at this time. If successful, it will probably be submitted as an open standard.

4. Radio Positioning. M-LMS Multilateration, along with MBC TDOA and AOA Position, Navigation and Timing (PNT) functions, both on stand-alone basis and by augmentation of GPS-GNSS. Including nationwide back up of GPS positioning. This is possible based on research and tests. This development is proprietary at this time. If successful, it will probably be submitted as an open standard.

5. N-RTK delivery. One-way datacasting of N-RTK augmentation of GPS-GNSS to sub-foot levels for smart transportation (Intelligent Transportation Systems) and other purposes.

6. ITS general datacasting. One-way datacasting of other critical information for ITS, e.g., road conditions, warnings, weather, on board navigation map updates, etc. road-side facilities, on-board GIS navigation maps updates, etc. Only some warnings are close to real time.

7. General datacast. Other one-way and two-way data, including for commercial for-profit services such as fleet dispatch, merchant location-based advertising, etc. Extra capacity (vs. above services) flows to mobile phones, radios and computers: updates useful databases (public and private websites and systems, etc.).

8. Local emergency capacity. Extra wireless capacity and coverage in local emergencies. Preemption arranged of substantial capacity: any above not as critical. Also, bring on extra capacity: see below.

9. National and regional emergency backup. Back up of critical US government and industries (transport, electric, water, pipelines, etc.) communications in case of major disruption (attacks- MBC even survives nuclear, major natural disasters, unexpected systems failures): MBC is especially secure, easy to preempt and keep secure, geographically extensive, cost effective, and if achieve the timing and positioning indicated above, it backs up: (1) communications, (2) timing, (3) positioning, and (4) maritime and some air comm- not only land: all four essential to critical government and industry. Besides our 20-30 MBC master stations and terminals in use, can work with government to cache other master and terminal equipment at strategic locations: some on hot standby, and some at FedEx, UPS, and USPC air-freight hubs for quick deployment.

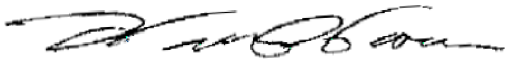
This plan will put to use all of Sky-Tel's *M-LMS* (held by Skybridge Spectrum Foundation and Telesaurus Holdings GB LLC) very effectively and fully: the MBC will provide the very cost effective nationwide full-coverage network, and the *M-LMS* and other Sky-Tel 900 and 200 MHz will link off of the MBC network and be successively built out/ used in traditional wide-area wireless (including multilateration) and mobile and fixed nets.

- III-

As previously noted, we also plan in-person presentations on these matters to FCC staff this year once we can line up experts and other arrangements.⁹

These will be coordinated with meetings with members of Congress and various other Federal agencies on these matters.

Respectfully,



Warren Havens
President
Skybridge Spectrum Foundation (M-LMS licensee)
Telesaurus Holdings GB LLC (M-LMS licensee)
And associated LLCs indicated above¹⁰

Attachment

⁹ This was planned for earlier; however, the above-noted MBC developments including the months-long Auction 87 proceeding delayed the trip to DC for these presentations. In addition, prior to the trip, we wanted to further progress and document our plans, as in part shown above.

¹⁰ Skybridge Spectrum Foundation is an IRS-recognized tax-exempt 501(c)(3) organization. These other LLCs hold FCC licenses in lower 200 MHz and MAS 900 MHz. All of the captioned LLCs are managed by Warren Havens, who is also Director (and trustee in the public interest) of Skybridge Spectrum Foundation. The Foundation (on a nonprofit basis) and these LLCs (on a combined profit and supportive charitable basis) have cooperative plans to use their respective FCC licenses for public-interest wireless, principally, “intelligent” or “smart” transportation, energy, and environment radio systems nationwide. No financial or economic benefits flow from Skybridge to said LLCs or to any private party: all Skybridge assets and actions, under expert nonprofit legal counsel guidance, are in support of government purposes and other IRS-approved public-benefit publicly disclosed purposes. In part for these reasons, Skybridge reveals publicly its plans far more extensively than if it were a private for-profit entity. All the Sky-Tel entities also do that in this and other presentations in this docket in attempt to mitigate the risks and damages caused by the subject NPRM.